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Colorado Department  
of Public Health  
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April 4, 2003

Mr. Chuck Stilwell  
Environmental Manager  
Atlantic Richfield Company  
307 East Park Street, Ste. 400  
Anaconda, MT 59711

**Re: August 12, 2002 Comments on the Draft Water Quality Assessment (WQA) for the Rico-Argentine Mine Site**

Dear Mr. Stilwell:

Thank you for your continuing efforts to work with the Water Quality Control Division (WQCD) to develop a water quality assessment for the Rico-Argentine Mine Site. Our office has authorized work on this project to continue and therefore we are taking this time to briefly summarize the key issues and recommendations identified in your above referenced letter, as well as to summarize specific technical comments on the WQA and ARCO's proposed approach as contained in the attachment to the letter.

There appears to be a significant difference in the ideology subscribed to by each of our organizations, and therefore the current technical approaches followed by the WQCD and those proposed by ARCO are not commensurate. We believe that until all relevant parties agree to certain principles, revisions to the WQA would be superfluous. Therefore, we propose to host a facilitated meeting in which all relevant parties are present and during which many of the issues of concern can be resolved.

As part of this letter, the WQCD has summarized the differences in position contained in the five key issues and two recommendations outlined in the above referenced letter, and the nine technical comments and six recommended WQA changes contained in the attachment to the letter. The WQCD's position on the various issues is typed in **bold print**.

### Five Key Issues

1. ARCO believes that modeling nearby dischargers based on a Total Maximum Daily Load (TMDL) type of approach is not warranted.

Current WQCD procedures to calculate assimilative capacities are similar to approaches used in the development of TMDLs. Specifically, the WQCD's current procedures for WQA development include the calculation of assimilative capacities for all nearby point source discharges that have impact on the available assimilative capacity of the receiving stream(s) being modeled. The WQCD's current WQA development approach also is similar to the TMDL development approach in that it takes into account upstream contributions, hardness downstream of the discharge location, and in-stream low flows. Ultimately, the approach taken in the WQA is in accordance with current WQCD procedures, regardless of the similarities of this approach with TMDL development.

2. The WQCD developed assimilative capacities for all adits and seeps of which they were aware of at the time of the preparation of the WQA. ARCO believes that the assimilative capacities allocated to the seeps and adits are not warranted, and these allocations result in lessened assimilative capacities being available to the St. Louis Ponds system.

It is the WQCD's current procedure to develop assimilative capacities for all nearby point source discharges that have impact on the available assimilative capacity of the receiving stream(s) being modeled, regardless of the lessened assimilative capacities that may result for some discharges. The approach used in the WQA is consistent with current procedures and the WQA conclusions were based on the data available at the time of the WQA preparation. However, since the development of the WQA, the WQCD has learned of an additional adit discharge, not yet named, to Silver Creek for which the WQCD will need to determine assimilative capacities. Therefore, the WQCD will conduct a minor modification to the WQA and can further adjust assimilative capacities at other seeps, adits, and the St. Louis Ponds where additional data become available that justify such.

3. The WQCD used average flows when developing assimilative capacities for all seeps and adits except the St. Louis Ponds, for which the maximum of the monthly average flows based on seasons were used. ARCO does not believe that adit and seep average flows occur at times of in-stream low flows and also believes that seasonal flows should be taken into account for seeps and adits.

When developing design flows for mine discharges (where adequate data are available), it is the WQCD's current procedure to establish design flows based on the maximum of the monthly averages in a season. The effluent flow data for seeps and adits are very limited and thus data to compute the maximum of the monthly averages for each season were not available. Instead, the long term average flows were determined and used as design flows in the WQA. Note that this approach is consistent with WQCD procedures as well as 40 CFR 122.45(b) which specifies the use of a reasonable measure of effluent flow when establishing limits. Unless additional data are available for use in determining more appropriate design flows for seep discharges and adit discharges during various seasons and at times of in-stream low flow, the current design flows as determined in the WQA will be utilized.

4. The WQCD conducted an antidegradation review for the discharges to undesignated receiving streams, which resulted in antidegradation-based average concentrations (ADBACs) being determined for several point source discharges. ARCO does not believe that antidegradation should apply because the discharges already exist.

An antidegradation review is triggered in an undesignated stream when a proposed permitted load is greater than the current permitted load. The current permitted loads for all point source discharges evaluated in the WQA are zero (because the discharges are currently unpermitted) and therefore the proposed permitted loads are greater than the current permitted loads. This subjects the discharges to antidegradation reviews. The WQCD must follow the procedures outlined in the antidegradation guidance document, as amended, when completing antidegradation reviews. According to the guidance, ADBACs are calculated based on the ambient upstream existing quality and the Division may include the existing discharge quality of historic draining adits. When developing the ADBACs in the WQA, the existing discharge quality was therefore included in the calculation of ADBACs. The guidance also indicates that ADBACs must be established unless the facility chooses to retain its permit limits based on its current permitted load (which is zero because none of the discharges are currently permitted) or an alternatives analysis is completed, which would also result in the development of alternatives to the calculated ADBACs. At this time, an alternative analysis has not been completed and the permit limits based on the current permitted load have not been selected. Therefore, the calculated ADBACs must be applied. Where additional data become available that would affect the calculated ADBACs or their applicability, minor modifications to the WQA may be accomplished.

5. The WQCD determined the zinc loading contributed by each point source and compared it to the total assimilative load of the receiving stream. ARCO believes that the zinc loadings calculated for each point source were not substantiated, and also suggests that no exceedances of zinc standards in the Dolores River have been identified.

The data used in the WQA were obtained almost exclusively from ARCO and its consultants, and the values used in the calculations of the contributed point source loadings were based on such data and discussed during meetings with ARCO. Therefore, the WQCD believes that the data were "substantiated." Although analytical testing of the Dolores River may not have revealed exceedances of zinc standards to date, it should be pointed out that sample collection has never taken place during times of low flows, whereas the comparison of contributions of zinc to the assimilative capacity for zinc are based on low flow periods. If additional data become available that justify an adjustment to the design flows that were used in the

calculations of zinc loadings contributed by each point source, then the comparison of the contributions by each point source to the total assimilative load of the receiving stream will also be modified.

## **Two Recommendations**

1. ARCO recommends that assimilative capacities for the St. Louis ponds be based on a simple mass balance at the ponds.

ARCO's proposed solution is not consistent with current WQCD procedures because the WQCD's current procedures are to develop assimilative capacities for all nearby point source discharges that have impact on the available assimilative capacity of the receiving stream(s) being modeled.

2. ARCO recommends that, if assimilative capacities for existing point sources are determined, the assimilative capacity at the point of discharge of Silver Creek to the Dolores River should be used in lieu of calculating assimilative capacities at the point of discharge of the Argentine Seep and other adits.

It is the WQCD's current procedure to develop assimilative capacities for all nearby point source dischargers that have impact on the available assimilative capacity of the receiving stream(s) being modeled. The available data at the confluence of Silver Creek with the Dolores River do not adequately characterize the Argentine Seep and other adit discharges and therefore would not be appropriate to use. This is because there are only limited data available at the confluence and because sampling at the confluence did not occur primarily during times of in-stream low flow.

## **Nine Technical Comments**

1. ARCO indicates that TMDLs are required only when a stream segment is water quality-limited, and the Dolores River is not listed as such. ARCO therefore objects to a TMDL type of approach being used in the evaluation of the St. Louis Ponds. ARCO points out that previous permitting efforts for the St. Louis ponds did not involve modeling of nearby adits and seeps. ARCO also points out that the WQCD has replaced the term TMDL with assimilative capacity, thereby supporting ARCO's contention that a TMDL is not necessary. ARCO again suggests the use of a simple mass balance equation when determining effluent limits for the St. Louis ponds.

The WQA was developed using current WQCD procedures to calculate assimilative capacities, which are more comprehensive than the procedures used in the past. These procedures are similar to TMDL approaches as previously discussed in the Five Key Issues, Number 1. Additionally, a simple mass balance equation would not be consistent with current WQCD procedures as previously discussed in the Two Recommendations, Number 1.

2. ARCO indicates that the inclusion of adits and seeps as point sources is not appropriate and that, if the adits and seeps are modeled, the flows and loadings must be revised to reflect in-stream low flow and seasonal conditions. ARCO indicates that the WQCD previously considered adits and seeps as non-point sources and therefore the adits and seeps should be accounted as background.

The position of the WQCD and the EPA is that adit and seep discharges are point sources and therefore they must be considered as such in the WQA. As set out in the Five Key Issues, Number 3, unless additional data are available for use in determining seasonal design flows that correspond to in-stream low flows, the current design flows as determined in the WQA will be utilized.

3. ARCO believes that the flows from the adits and seeps should account for seasonal variations and the effects of in-stream low flows. ARCO indicates that the determination of low flows at multiple points throughout the basin, which uses the annual average flows from the adits and seeps, results in a far too conservative in-stream low flow analysis.

When developing in-stream low flows, the most ideal situation is the existence of a flow gage immediately upstream of each discharge location. In this analysis, there were no gages located upstream of the point source discharges and therefore reliance on the downstream gage station was required. In such cases, the standard WQCD approach is to establish a simulated natural flow drainage by deducting point source contributions and adding in any water diverted at points upstream, use the simulated natural flow drainage record to establish in-stream low flows at the gage station, and then apply a ratio of the watershed upstream

of the discharge point to the watershed of the gage station. Consistent with this procedure, when determining the in-stream low flows as part of the Rico-Argentine Mine Site WQA, the design flows of the adits and seeps, as well as the St. Louis Ponds, were deducted and the Town of Rico's water supply diversion was added to the low flows determined at the downstream gage station in order to simulate natural drainage flow. Then, watershed ratios were applied in order to determine low flows upstream of the multiple discharge points. The WQCD acknowledges that, if smaller design flows are used, a greater in-stream low flow would result. However, as previously set forth in the Five Key Issues, Number 3, data to determine design flows for seeps and adits are extremely limited and therefore, unless additional data become available, the currently calculated design flows will be used. Note that if additional available data allow the WQCD to modify the design flows that are used for each point source, then the in-stream low flows will be modified as well.

4. ARCO objects to the assumption of 0% dilution in tributary wetlands to the Dolores River. ARCO points out that if 0% dilution is assumed, then impacts to the Dolores River from the wetlands should be excluded from the assessment. ARCO suggests that the full dilution of the receiving stream be used instead and that the removal of portions of the loading by the wetlands also be taken into account.

It is the approach of the WQCD to assume that discharges to lakes and wetlands have no available dilution, absent a mixing zone study that indicates otherwise. Wetlands are afforded protection of their water quality standards just like any other water of the state. The use of wetlands as a treatment unit, unless they are created wetlands, cannot be accommodated and therefore removal accomplished in the wetland cannot be credited. However, the available dilution, if shown to be greater than 0% by a mixing zone study, can be used for minor modifications to the WQA evaluation.

5. ARCO objects to the St. Louis Ponds' seasonal discharge flows used in the WQA, which represented the maximum of the monthly average flows in the respective seasons. ARCO recommends use of the design flows they provided.

For mining operations, it is the standard approach of the WQCD to use the maximum of the monthly average flows when determining seasonal "design" flows to be used in the WQA. Therefore, in order to be consistent with WQAs completed for other mining operations, the WQCD used the seasonal maximum of the monthly average flows when completing the Rico-Argentine Mine Site WQA. However, the WQCD agrees that the use of the design flows provided by ARCO would be an appropriate substitute and will use the ARCO-specified seasonal flows in the WQA revision. Note that the WQCD believes that the use of the design flows provided by ARCO would be consistent with 40 CFR 122.45(b).

6. ARCO believes that it would be more appropriate to develop assimilative capacities for seeps and adits based on their actual effluent quality.

ARCO objects to the background concentrations used in the calculation of assimilative capacities, particularly indicating that seasonal ambient water quality data should be evaluated and suggesting that calculations of negative assimilative capacities indicate that the data are not accurate.

ARCO also indicates that it does not believe that the individual discharges from the Blaine Adit and Argentine Seep should be used when determining the remaining assimilative capacity in the Dolores River, but instead the quality of Silver Creek at the confluence of the Dolores River should be used.

Assimilative capacities for seeps and adits can be reduced to reflect their actual effluent quality as part of the allocation of assimilative capacity. However, the allocation of assimilative capacity must be agreed upon among dischargers prior to any load trading.

It is the standard procedure of the WQCD to use upstream ambient water quality in its determination of a receiving stream's available assimilative capacity, as well as to accommodate requests for the determination of seasonal upstream ambient water quality where appropriate and where data are adequate. Furthermore, it is the approach of the WQCD to use the 85<sup>th</sup> percentile concentration for dissolved metals and the 50<sup>th</sup> percentile for total recoverable metals when determining upstream ambient water quality for use in these calculations. In developing the Rico-Argentine Mine Site WQA, the appropriate percentile was used in the development of available in-stream assimilative capacities. However, because limited ambient water quality data were available, these data were not deemed adequate for use in determining seasonal upstream ambient water quality concentrations. Instead, the entire data set was used to establish year-round upstream ambient

water quality concentrations. The resulting negative assimilative capacities are an indication that upstream ambient water quality concentrations exceed in-stream standards. Ergo, the WQCD does not agree with ARCO's contention that the calculations are flawed and also points out that the data that were used to determine the upstream ambient water quality were provided primarily by ARCO and its consultants. Should additional data become available that would allow for the determination of more accurate seasonal upstream water quality concentrations, minor modifications to the WQA can be accomplished.

As previously indicated, the position of the WQCD and the EPA is that adits and seeps are point sources. Furthermore, these contributions must be taken into account when determining available assimilative capacities in a receiving stream as per WQCD standard procedures. The available data at the confluence of Silver Creek with the Dolores River do not adequately characterize the Argentine Seep and other adit dischargers as previously discussed in the Two Recommendations, Number 2.

7. ARCO believes that the determination of mean in-stream hardness concentrations at multiple locations is not appropriate and indicates that a hardness concentration for the entire segment should be determined and used. Furthermore, ARCO indicates that it does not believe the use of a mean concentration using all available data is appropriate and that there are not adequate data to perform a regression analysis and instead suggests that only data reflective of low flow conditions be used. In sum, ARCO proposes that a segment-wide mean hardness be determined based only on hardness data obtained during low flow periods.

When establishing in-stream standards based on hardness, current WQCD procedures are to calculate the hardness concentration either via a regression analysis, where adequate data are available, or to use available data to determine a mean hardness value. It is the WQCD's standard procedure to develop assimilative capacities for receiving waters based on the nearest reliable downstream hardness data rather than utilizing a segment-wide hardness value. This is particularly important in receiving water bodies where hardness varies, which is the case in Silver Creek (which ranges from an average of 84 mg/l downstream of the Blaine Adit portal to 213 mg/l downstream of the Argentine Seep) and the Dolores River (which ranges from an average of 171 mg/l below the St. Louis Ponds to 400 mg/l in the tributary wetlands). As part of the WQA, the downstream hardness concentration below each discharge location was determined using the mean concentration based on available data; a regression analysis was not conducted because available data were not believed to be adequate for such an analysis. Because available data are so severely limited, exclusion of select data points would not be appropriate and would not adequately characterize a "low flow" hardness. Unless additional data become available for use in determining downstream hardness concentrations during times of in-stream low flow, the current downstream hardness concentrations determined at the various locations in the basin will be utilized.

8. ARCO objects to the calculations that indicate that the zinc point source loading contributions exceed the assimilative capacities at times of low flow. ARCO indicates that ambient water quality sampling data do not support the calculations.

ARCO indicates that it would be appropriate to exclude several parameters evaluated in the WQA, particularly, arsenic, selenium, chromium, nickel, mercury, and cyanide.

The WQCD will re-evaluate the values used in the calculations of zinc loadings contributed by point sources during times of in-stream low flows based on the issues already discussed under the Five Key Issues, Number 5.

When completing WQAs, it is the approach of the WQCD to develop assimilative capacities for all pollutants potentially of concern for which there are standards. When completing a permit rationale, it is the procedure of the WQCD to conduct a "reasonable potential analysis" to determine whether pollutants such as arsenic, selenium, chromium, nickel, mercury, and cyanide have a reasonable potential to cause or contribute to exceedances of water quality standards. Those with "reasonable potential" are included in a CDPS permit. Therefore, in accordance with current WQCD procedures, it would be inappropriate to exclude the parameters noted by ARCO at this time.

9. ARCO does not believe that antidegradation should apply because the discharges already exist.

This issue was already discussed under the Five Key Issues, Number 4.

## **Six Recommended WQA Changes**

1. ARCO again suggests the use of a simple mass balance to determine effluent limits for the St. Louis ponds, only.

As mentioned before, ARCO's proposed solution is not consistent with current WQCD procedures, which are to develop assimilative capacities for all nearby point source discharges that have an impact on the available assimilative capacity of the receiving stream(s) being modeled.

2. ARCO indicates that if the adits and seeps must be modeled with the St. Louis ponds, the WQA should be revised to account for the following:

- a. The flows from the adits and seeps used in the WQA should account for seasonal and low flows. In-stream low flows should be revised to incorporate the revised discharge flows from the adits and seeps.

**The WQCD's procedures for determining appropriate design flows and their impact on the in-stream low flows have been discussed under the Five Key Issues, Number 3 and the Nine Technical Comments, Number 3.**

- b. A segment-wide mean hardness should be determined based on low flow periods.

**The WQCD's procedures for determining appropriate hardness have been discussed under the Nine Technical Comments, Number 7.**

- c. Assimilative capacities for discharges from adits and seeps should be based on effluent quality and quantity data collected during low flow conditions.

**The WQCD's procedures for determining and allocating assimilative capacities for discharges from seeps and adits have been discussed under the Nine Technical Comments, Number 6 and the Five Key Issues, Number 3.**

- d. The actual quality of the discharge from tributary wetlands should be used in modeling versus the individual point source load contributions.

**The WQCD's procedures for handling contributions from tributary wetlands have been discussed under the Nine Technical Comments, Number 4.**

- e. The design flows for the St. Louis ponds provided by ARCO should be used.

**The WQCD agrees that the use of the design flows provided by ARCO would be an appropriate substitute and will use the ARCO-specified seasonal flows in a minor WQA revision for the reasons set forth in the discussion under the Nine Technical Comments, Number 5.**

Thank you for submitting your comments on the Water Quality Assessment. If you have any questions, please contact me at 303-692-3510. I will be in contact with you soon to schedule a meeting where we can discuss these comments and responses in more detail.

Sincerely,



Susan Robinette  
Permits Unit Manager

Cc: Regina Meehan, FABL Environmental Regulatory Specialists, Inc.  
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